APPENDIX A
TO
ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT
FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY
FOR
ANACONDA ALUMINUM Co COLUMBIA FALLS REDUCTION PLANT SITE,
COLUMBIA FALLS, MONTANA

STATEMENT OF WORK

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REMEDIAL INVESTIGATION/FEASIBILITY STUDY

Anaconda Aluminum Co Columbia Falls Reduction Plant Site

1. INTRODUCTION

This Statement of Work (SOW) is part of and incorporated into the Administrative Settlement Agreement and Order on Consent for Remedial Investigation / Feasibility Study (Settlement Agreement) for the Anaconda Aluminum Co Columbia Falls Reduction Plant Site located in Columbia Falls, Montana (Site). Unless otherwise expressly provided in this SOW, the terms used herein that are defined in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or such regulations. Whenever terms defined in the Settlement Agreement are used in this SOW, they shall have the same meaning assigned to them in the Settlement Agreement.

The Environmental Protection Agency (EPA) has established initial study area boundaries for the purpose of planning and developing the preliminary scope of the remedial investigation / feasibility study (RI/FS). The initial study area is the approximately 1,000-acre historical and observed operations area of the Site. This initial study area includes the waste disposal areas associated with the aluminum reduction plant and the surrounding geographic area which may have been impacted by current and/or historical releases of hazardous substances from the plant. The EPA will determine the final Site boundaries based on the information generated during the RI/FS.

2. SITE DESCRIPTION

Located on an approximately 3,196-acre property owned by Columbia Falls Aluminum Company, LLC (CFAC) in Flathead County, Montana, the Site is now a defunct aluminum reduction plant. The facility operated from 1955 through 2009. The plant is locally referred to as the CFAC facility. The main site facility and potline buildings are located approximately two miles northeast of the City of Columbia Falls.
Current Site use is primarily for minimal plant maintenance activities, wildlife corridors, and local specially permitted hunting. Access to the Site is available via Aluminum Drive and through private land from the north. The closest residence is adjacent to the western CFAC property boundary and is approximately 0.92 miles from the main plant.

The Site area is composed of numerous buildings and industrial operating facilities, such as offices, warehouses, mechanical shops, a paste plant, coal tar pitch tanks, pump houses, and the main potline building. Features of the Site include, but are not limited to, percolation ponds, leachate ponds, sludge pond landfill, sewage treatment ponds, cathode soaking pits, closed and operational landfills, including asbestos landfills and spent potliner landfills, and a transformer yard.

Spent potliner, a byproduct of aluminum production at the facility, was landfilled on site from the initial operation of the plant in the 1950s through approximately 1990. The EPA classified as a hazardous waste under the Resource Conservation and Recovery Act (RCRA) in 1988. Wet scrubber sludge, a waste generated from the wet scrubber system was landfilled on site until approximately 1980. There are several underground and above ground storage tanks located throughout the property.

In 2014, the EPA completed a Site Reassessment at the Site. This effort included a limited, screening level environmental sampling event to collect information to evaluate the Site using the Hazard Ranking System (HRS). As part of the screening level analysis, 68 samples were collected in the ground water, surface water, sediments, waste sediments, and surface soil media. The EPA evaluated key features at the Site, including the landfill area, north infiltration pond and south infiltration pond.

Ground water samples collected from monitoring wells at the Site down gradient of source areas contained multiple contaminants, including cyanide, fluoride, and various metals with concentrations above federal drinking water standards. Flathead River and Cedar Creek were sampled for contaminants of concern. Samples of surface water or sediments from Flathead River had detections of cyanide, manganese and fluoride downstream of the probable point of entry. Samples of surface water from Cedar Creek had detections of cyanide.

3. PURPOSE OF THE STATEMENT OF WORK

This SOW describes the Work, including the requirements for undertaking and completing an RI/FS for the Site. The purpose of the RI/FS process is to 1) investigate the nature and extent of contamination at and from the Site study area, 2) assess human health and ecological risks, and 3) develop, screen and evaluate potential remedial alternatives for the Site.

The Respondents shall conduct the RI/FS in accordance with the requirements in the Settlement Agreement and this SOW and consistent with the National Oil and Hazardous Substance Contingency Plan (NCP), 40 C.F.R. Part 300, and the EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*, EPA 540/G-89/004, OSWER Directive #9355.3-01 (Oct. 1988) and any other guidance documents that the EPA identifies as relevant to any aspect of conducting an RI/FS for the Site. A list of primary guidance documents is included as Attachment I to this SOW.

As specified in CERCLA Section 104(a) (1), as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, the EPA will provide oversight of the Respondents' Work throughout the RI/FS. EPA oversight activities include, but are not limited to, inspecting records, operating logs and contracts; conducting tests, inspections, and sampling; using a camera, or other documentary-type equipment; verifying the work performed and data collected by the Respondents; and otherwise reviewing the conduct of the Respondents in carrying out the terms of the Settlement Agreement. The Respondents shall support the EPA's effort to initiate and conduct oversight activities.

Performance of the Work described in this SOW by the Respondents and the EPA's review and approval of documents and activities described in this SOW shall be performed in accordance with the procedures described in the Settlement Agreement. The EPA will consult with the Montana Department of Environmental Quality (MDEQ), as appropriate. The Respondents shall furnish all necessary personnel, materials, and services needed or incidental to, performing the work described in this SOW, except as otherwise specified in the Settlement Agreement.

4. GENERAL REQUIREMENTS

The Respondents are required to implement RI/FS activities that will result in defensible data for a well-supported Record of Decision that when implemented through a remedial action will eliminate, reduce, or control risks to human health and the environment. In conducting the RI/FS, the EPA expects the Respondents to propose and implement the most appropriate and cost-effective procedures and methodologies using accepted engineering practices and controls. The Respondents shall furnish all necessary and appropriate personnel, materials, and services needed for, or incidental to, performing and completing the RI/FS in accordance with the requirements of this SOW.

The EPA has reviewed the 2014 Site Reassessment Report, which summarizes sampling activities carried out during the preliminary site reassessment. Based on this review, the RI/FS will be comprised of the following major activities:

- 1). Determination of project scoping;
- 2). EPA community involvement activities;
- 3). Records management;
- 4). Site characterization (remedial investigation, reuse assessment, risk assessment and remedial investigation report);
- 5). Development and screening of remedial alternatives (feasibility study);
- 6). Treatability studies; and
- 7). Detailed analysis of alternatives (feasibility study report).

The RI/FS will be developed based on information obtained through these Site activities as well as previously obtained information.

The RI will commence with an initial investigative phase, and it is anticipated that there will be multiple investigative phases of the RI. The initial investigative phase of the RI will focus on data gaps, including but not limited to: 1) soils; 2) landfills; 3) ground water; 4) surface water; 5) ground water / surface water interactions, 6) waste sediment in the percolations ponds (figure 2 in the analytical report for site assessment), 7) wastewater impoundments; and 8) stream banks and sediments. The EPA, in consultation with the Respondents, will determine the specific investigative phases to complete the RI. The requirements of this SOW apply to each investigative phase of the RI, regardless of the order in which they are addressed. Work on any one investigative phase of the RI/FS need not preclude work on any other phase.

The Respondents shall conduct each phase of the RI in accordance with an EPA-approved Sampling and Analysis Plan (SAP). The Respondents shall refer to the requirements at 40 C.F.R.

§ 300.415(b)(4)(ii) in preparing the SAP. The Respondents also shall document the results of each investigative phase of the RI in summary reports.

The Respondents shall notify the EPA in advance of field work starting for each investigative phase of the RI in accordance with the schedule in Attachment I to this SOW, unless the EPA and the Respondents mutually agree to a different schedule. The Respondents also shall provide a monthly progress report for all RI/FS Work in accordance with the schedule in Attachment I to this SOW. In addition, the Respondents shall notify the EPA in writing upon completion of field activities for each investigative phase of the RI.

The project deliverables associated with this SOW include but are not limited to:

- 1). A compilation of existing information relevant to the RI/FS;
- 2). Project scoping proposal;
- 3. A draft written summary of the major outcomes of the project scoping follow-up meeting;
- 4). A proposed RI/FS Work Plan which describes the RI/FS;
- 5). An initial Health and Safety Plan (HASP), and revised task-specific HASPs, as appropriate;
- 6). Phase-specific Sampling and Analysis Plans (SAPs);
- 7). A summary report for each phase of the RI;
- 8). A reuse assessment to assist in determining the reasonably anticipated future land use(s) for the Site;
- 9). A draft Baseline Human Health Risk Assessment;
- 10). A draft Ecological Risk Assessment;
- 11). A draft and final RI Report;
- 12). A Remedial Action Objectives Memorandum;
- 13). A technical memorandum summarizing the Work performed in the development and screening of remedial alternatives;
- 14). A draft Treatability Studies Work Plan and a draft Treatability Studies Report (if required by the EPA);
- 15). A draft and final Feasibility Study report, including technical memorandum on institutional controls; and
- 16). A project database for the RI/FS.

A summary of each deliverable is provided below. A schedule for deliverables and related activities is provided in Attachment I to this SOW.

The EPA provides oversight of PRP activities throughout the RI/FS. EPA review and approval of deliverables is a tool to assist this process and to satisfy, in part, the EPA's responsibility to provide effective protection of public health, welfare, and the environment. The EPA also reviews deliverables to assess the likelihood that the RI/FS achieves its goals and that its performance and operations requirements have been met. Acceptance or approval of deliverables by the EPA does not relieve the Respondents from responsibility for the adequacy of the deliverables or their professional responsibilities.

To facilitate EPA oversight, the Respondents shall: 1) communicate at least weekly with the EPA Remedial Project Manager (RPM), either in face-to-face meetings or through conference calls; 2) document all decisions that are made in meetings and conversations with the EPA; and 3) provide this documentation to the EPA RPM within five days of the meeting or conversation.

The EPA reserves the right, in consultation with the Respondents, to create Operable Units (OUs) at the Site to facilitate the investigation and cleanup of the Site. If the EPA creates multiple OUs, the requirements of this SOW apply to each OU, regardless of the order in which the OUs are addressed. The deliverables and activities discussed in Sections 5-12 below will be completed for each OU.

5. ACTIVITY #1: DETERMINATION OF PROJECT SCOPING

5.1 Initial Planning for the RI/FS

5.1.1 Assemble Existing Information

In accordance with the schedule in Attachment I to this SOW, the Respondents shall assemble existing information relevant to the RI/FS for the Site, including but not limited to:

- 1). All documentation and reporting of historical operations activities and studies concerning the former aluminum reduction plant and contaminants associated therewith;
- 2). All environmental sampling and analysis plans;
- 3). All environmental and other data, maps and photographs; and
- 4). All reports describing data summaries, data evaluations, or interpretations of data.

This includes available data relating to the types and quantities of hazardous substances, pollutants, or contaminants and past and current material management and disposal practices.

5.1.2 Project Scoping Proposal

In accordance with the schedule in Attachment I to this SOW, the Respondents shall utilize the assembled existing information to develop a project scoping proposal, including a conceptual understanding of sources and areas of contamination as well as potential exposure pathways and receptors. This project scoping proposal will describe the purpose and parameters of the field visit described below. The Respondents shall provide a project scoping proposal for EPA consideration prior to the field visit described below.

5.1.3 Conduct Field Visit

As a follow-up to the project scoping proposal and in accordance with the schedule in Attachment I to this SOW, the Respondents shall conduct a field visit of the Site to complete project scoping and assist in developing a conceptual understanding of sources and areas of

contamination as well as potential exposure pathways, receptors, and logistical considerations. The EPA, in consultation with the Respondents, will determine purpose and parameters of the field visit. Respondents shall include the EPA in this field visit and coordinate with the EPA to determine a mutually agreeable date, including providing notification to the EPA of the field visit in accordance with the schedule in Attachment I to this SOW. The EPA may also invite other interested agencies to participate in the field visit.

In accordance with the schedule in Attachment I to this SOW, the Respondents shall prepare a narrative in a report format describing the field visit, including photographs of visit activities and findings.

5.1.4 **Project Scoping Summary**

Based on review of the assembled existing information and the field visit, the Respondent shall develop a draft project scoping summary in consultation with the EPA. This project scoping summary will include:

- 1) preliminary problem statements;
- 2) conceptual site models of potential exposure pathways;
- 3) potential human health and ecological receptors; and
- 4) identify any data gaps with recommended approaches to prioritize and fill the identified gaps.

The Respondents shall submit this draft project scoping summary for EPA review and EPA approval in accordance with Section X of the Settlement Agreement (EPA Approval of Plans and other Submissions) and the schedule in Attachment I to this SOW. The Respondents shall use the EPA-approved project scoping summary for the Site. The EPA may confer with other interested agencies in reviewing the draft project scoping summary.

6. ACTIVITY #2: COMMUNITY INVOLVEMENT

The EPA will develop a community involvement plan for the implementation of community involvement activities for the RI/FS. The Respondents shall, as requested by the EPA, assist the EPA by providing information regarding the Site and Site history, participating in public meetings or other informational or advisory meetings, developing fact sheets including graphics, placing newspaper advertisements developed by the EPA, or distributing fact sheets developed by the EPA. All Respondent-conducted community relations activities will be subject to oversight by the EPA.

7. ACTIVITY #3: RECORDS MANAGEMENT

Respondents shall submit all sampling and monitoring data in the standard EPA Region 8 Superfund Electronic Data Deliverable (EDD) format. The standard EDD format is the Scribe software, which is a Microsoft Access database designed to manage environmental data. The Scribe software functions as the EPA database of record for analytic data from all Region 8 Superfund sites. Information on Scribe software can be found at

http://www.ertsupport.org/scribe_home.htm. Scribe.NET will be used as the primary data management and storage tool for the EPA analytical and field data. The Respondents shall refer to the *EPA Region 8 Superfund Remedial Data Management Plan* (Version 0.8 (Apr. 2, 2015) or most current version) for a description of data management practices utilizing the Scribe database. Other delivery EDD methods may be allowed as technology changes and as approved by the EPA.

Respondents shall manage and store include the sampling data generated during the EPA's Site Reassessment as well as new sampling and monitoring data collected pursuant to this SOW in the Scribe project database. At the end of each sampling or data collection or compilation, and after the Respondents have completed data validation, the Respondents shall update the Scribe project database. The Respondents shall ensure that the EPA has unlimited access to the Scribe project database for the RI/FS throughout the RI/FS process. The Respondents also shall provide a complete copy of the updated Scribe database to the EPA.

Respondents shall submit all spatial data, including spatially-referenced data and geospatial data, in accordance with the *EPA Region 8 GIS Deliverable Guidance* (Version 1.1 (Jun. 1, 2015) or most current version).

8. ACTIVITY #4: SITE CHARACTERIZATION

The Respondents shall perform the site characterization activities described in this section. The overall objective of site characterization is to describe the nature and extent of contamination for the Site and to describe areas of the Site that may pose a threat to human health and/or the environment.

8.1 Project Scoping Follow-up Meeting

In accordance with the schedule in Attachment I to the SOW, the Respondents shall convene a project scoping follow-up meeting with the EPA as the initial step in the development of an RI/FS Work Plan and SAP. The Respondents shall coordinate with the EPA to determine the date and time for the project scoping follow-up meeting. The Respondents shall, in consultation with the EPA, develop an agenda and supporting materials and provide these to meeting participants prior to the project scoping follow-up meeting in accordance with the schedule in Attachment I to this SOW. The scoping meeting must be held prior to the development of the RI/FS Work Plan, HASP, and SAP. The EPA may invite other interested agencies to participate in the project scoping follow-up meeting.

After the project scoping follow-up meeting, the Respondents shall submit a draft written summary of the major outcomes of the project scoping follow-up meeting for EPA review and EPA approval in accordance with Section X of the Settlement Agreement and the schedule contained in Attachment I to this SOW. This written summary will identify the proposed investigative phases for the RI/FS. Both the RI/FS Work Plan and the SAP will be developed based on the outcomes in the EPA-approved written summary of the major outcomes of the project scoping follow-up meeting.

8.2 **RI/FS Work Plan**

In accordance with the schedule in Attachment I to the SOW, the Respondents shall submit a draft RI/FS Work Plan for EPA review and EPA approval. The RI/FS Work Plan will document the decisions and evaluations made during project scoping and describes the activities required to complete each investigative phase of the RI. The RI/FS Work Plan will provide a comprehensive description of the Work to be performed for the RI/FS, including the rationale for performing the required activities and the methodologies to be utilized in carrying out those activities. This will include a detailed description of the technical approach for the RI/FS activities, specifying each proposed investigative phase of the RI. It will also include the necessary tasks, including procedures, deliverables, and schedules for completion of each RI/FS activity, and deliverable by phase.

Required components of the RI/FS Work Plan include:

- 1). A list of key personnel, titles and responsibilities, including but not limited to, program manager, project manager, health and safety officer, and field superintendent;
- 2). A Site description;
- 3). A history of previous Site activities;
- 4). Key elements as identified in Table 2-3 and Appendix B to the *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*, EPA 540/G-89/004, OSWER Directive #9355.3-01 (Oct. 1988);
- 5). Reuse assessment;
- 6). Contingency plan;
- 7). A proposed plan for coordination with the EPA;
- 8). A schedule which describes anticipated milestones and timeframes for completion of the RI/FS; and
- 9). A HASP.

The EPA will approve the Respondents' RI/FS Work Plan in accordance with Section X of the Settlement Agreement. However, as discussed below, the EPA will accept but not approve the Respondents' HASP.

8.3 **Health and Safety Plan**

In accordance with the schedule in Attachment I to this SOW, the Respondents shall submit an initial HASP with the proposed RI/FS Work Plan. The HASP describes all activities to be performed to protect on Site personnel and area residents from physical, chemical, and all other hazards posed by the Work. The Respondents should develop the HASP in accordance with the EPA's Emergency Responder Health and Safety and Occupational Safety and Health Administration (OSHA) requirements under 29 C.F.R. §§ 1910 and 1926. The initial HASP should cover RI activities, and the Respondents should update the initial HASP to reflect phase-specific activities. The Respondents shall submit the updated HASP(s) concurrently with phase-specific SAPs. The EPA does not approve the HASP, but will review it to ensure that all necessary elements are included and that the plan provides for the protection of human health and the environment. The Respondents are solely responsible for ensuring the health and safety

of their employees, contractors, and subcontractors performing any of the work described in this SOW.

8.4 Sampling and Analysis Plan

8.4.1 SAP Development

The Respondents shall conduct each investigative phase of the RI using an EPA-approved Sampling and Analysis Plan (SAP). The SAP will cover the collection of physical and chemical data to further characterize current or threatened environmental impacts and to further delineate potential sources within the Site. These data will provide the basis for the development of remedial alternatives for the Site and the selection of a preferred alternative, as prescribed in the *Guidance for Conducting Remedial Investigations and Feasibility Studies*, EPA/540/G-89/004, OSWER Directive #9355.3-01 (Oct. 1988).

The Respondents shall submit the SAP for EPA review and EPA approval in accordance with Section X of the Settlement Agreement (EPA Approval of Plans and other Submissions) and the schedule in Attachment I to this SOW. The SAP must consist of two principal documents: (1) Field Sampling Plan; and (2) Quality Assurance Project Plan, as described below. A phase-specific SAP must be developed for each investigative phase of the RI, and is required before the collection of any physical or chemical data.

8.4.2 Field Sampling Plan

The Field Sampling Plan (FSP) supplements the QAPP and addresses all sample collection activities. The FSP must be written so that a field sampling team unfamiliar with the project would be able to gather the samples and field information required. The Respondents shall develop the FSP in accordance with *Guidance for Conducting Remedial Investigations and Feasibility Studies*, EPA/540/G-89/004, OSWER Directive #9355.3-01 (Oct. 1988).

8.4.3 Quality Assurance Project Plan

The Quality Assurance Project Plan (QAPP) addresses sample analysis and data handling regarding the Work. The QAPP must include a detailed explanation of the Respondents' quality assurance, quality control, and chain of custody procedures for all treatability, design, compliance, and monitoring samples. The Respondents shall develop the QAPP in accordance with *EPA Requirements for Quality Assurance Project Plans*, QA/R-5, EPA/240/B-01/003 (Mar. 2001, reissued May 2006); *Guidance for Quality Assurance Project Plans*, QA/G-5, EPA/240/R 02/009 (Dec. 2002); and *Uniform Federal Policy for Quality Assurance Project Plans*, Parts 1-3, EPA/505/B-04/900A though 900C (Mar. 2005). The QAPP must incorporate Data Quality Objectives (DQOs) as provided in EPA guidance. The QAPP also must include procedures:

- 1). To ensure that the EPA and its authorized representative have reasonable access to laboratories used by the Respondents in implementing the Settlement Agreement (Respondents' Labs);
- 2). To ensure that Respondents' Labs analyze all samples submitted by the EPA pursuant

to the QAPP for quality assurance monitoring;

- 3). To ensure that Respondents' Labs perform all analyses using EPA-accepted methods (*i.e.*, the methods documented in *USEPA Contract Laboratory Program Statement of Work for Inorganic Analysis*, ILM05.4 (Dec. 2006); *USEPA Contract Laboratory Program Statement of Work for Organic Analysis*, SOM01.2 (amended Apr. 2007); and *USEPA Contract Laboratory Program Statement of Work for Inorganic Superfund Methods (Multi-Media, Multi-Concentration)*, ISM01.2 (Jan. 2010)) or other methods acceptable to EPA;
- 4). To ensure that Respondents' Labs participate in an EPA-accepted QA/QC program or other program acceptable to the EPA;
- 5). For Respondents to provide the EPA with notice prior to any sample collection activity consistent with the schedule in Attachment I to this SOW;
- 6). For Respondents to provide split samples and/or duplicate samples to the EPA upon request;
- 7). For the EPA to take any additional samples that it deems necessary;
- 8). For the EPA to provide to the Respondents upon request split samples and/or duplicate samples in connection with the EPA's oversight sampling; and
- 9). For the Respondents to submit to the EPA all sampling and tests results and other data in connection with the implementation of the Settlement Agreement.

8.4.2 SAP Implementation (Field Sampling and Data Evaluation Summary Report)

The Respondents shall submit a Field Sampling and Data Evaluation Summary Report for each investigative phase of the RI for EPA review and EPA approval in accordance with Section X of the Settlement Agreement (EPA Approval of Plans and other Submissions) and the schedule established in the final SAP for that phase. Each summary report will include the field documentation specified in the SAP, a description of the physical characteristics of the study area, results of all required field quality control procedures, and results of all field and laboratory audits performed by the Respondents as specified in the SAP.

The summary report will also include maps delineating all sampling locations, tabular presentations of all data, evaluation of the data quality, test pit and/or boring logs, well construction details, and any other data collected. All analytical data will be provided to the EPA in an electronic format to be agreed upon as part of the SAP so that it can be entered into the EPA's SCRIBE database for permanent storage/archiving.

Analytical results developed under the SAPs must not be included in any summary report unless accompanied by or cross-referenced to a corresponding QA/QC report. The Respondents shall discuss deviations from the SAP, such as the collection of opportunistic samples, in the summary report. A more detailed description of the summary report contents will be included in each phase specific SAP. The Report of Field Sampling and Data Evaluation Activities will provide the basis for future site characterization discussions and must be presented in the RI report.

8.5 Reuse Assessment

In accordance with the schedule in Attachment I to this SOW, the Respondent shall prepare a reuse assessment. This involves collecting and evaluating information to develop assumptions about reasonably anticipated future land use(s) at Superfund sites. It provides a tool to implement the Superfund Land Use Directive, and may involve a review of available records, visual inspections of the site and discussions about reasonably anticipated future uses with local government officials, property owners and community members.

Information obtained from the reuse assessment can be particularly useful during the planning stages of a response action. The resulting assumptions of reasonably anticipated future use can be considered as part of the following:

- The baseline risk assessment when estimating potential future risks;
- The development of remedial/removal action objectives and the development and evaluation of response alternatives; and
- The selection of the appropriate response action required for the protection of human health and the environment.

The Respondents shall refer to the guidance on *Reuse Assessments: A Tool To Implement the Superfund Land Use Directive*, OSWER Directive #9355.7-06P (2001), in preparing the reuse assessment.

8.6 Baseline Human Health Risk Assessment and Ecological Risk Assessment

Following EPA approval of the final Field Sampling and Data Evaluation Activities Summary Report, Respondents shall prepare a draft Baseline Human Health Risk Assessment and Ecological Risk Assessment in accordance with Section X of the Settlement Agreement (EPA Approval of Plans and other Submissions) and the schedule in Attachment I to this SOW. Respondents shall perform the Baseline Human Health Risk Assessment and Ecological Risk Assessment ("Risk Assessments") as part of the RI in accordance with the applicable EPA guidance, including but not limited to, the current version of the following:

- *Interim Final Risk Assessment Guidance for Superfund, Volume I - Human Health Evaluation Manual (Part A)* (RAGS, EPA-540-1-89-002, OSWER Directive #9285.7-01A (Dec. 1989));
- *Interim Final Risk Assessment Guidance for Superfund, Volume I - Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments)* (RAGS, EPA 540-R-97-033, OSWER Directive #9285.7-01D (Jan. 1998)); and
- *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (ERAGS, EPA-540-R-97-006, OSWER Directive #9285.7-25 (Jun. 1997)).

Any information relevant to Site characteristics necessary for the development and evaluation of remedial alternatives including, but not limited to, the baseline human health and ecological risk assessments will be included in the RI Report described below.

8.7 Remedial Investigation Report

Following approval of the final Baseline Human Health Risk Assessment and Ecological Risk Assessment, the Respondents shall prepare a draft RI Report in accordance with Section X of the Settlement Agreement (EPA Approval of Plans and Other Submissions) and the schedule in Attachment I to this SOW. The Respondents shall refer to Table 3-13 in the EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*, EPA 540/G-89/004, OSWER Directive #9355.3-01 (Oct. 1988) for an example of an acceptable RI report format.

Analytical results developed under the SAP will not be included in any RI report unless accompanied by or cross-referenced to a corresponding QA/QC report. Within the RI report, the Respondents shall analyze and evaluate the data to describe the following:

- Physical and biological characteristics;
- Contaminant source characteristics;
- Nature and extent of contamination; and
- Contaminant fate and transport.

The RI Report will include the actual and potential magnitude of releases from the sources, and horizontal and vertical spread of contamination as well as mobility and persistence of contaminants and the stability of the impoundment embankments adjacent to the Flathead River. Where modeling is appropriate, such models will be identified in a letter submitted to the EPA for EPA review and EPA approval prior to the use of the model. All data and programming, including any proprietary programs, will be made available to the EPA.

8.8 Remedial Action Objectives Memorandum

The Respondents, in consultation with the EPA, shall develop a technical memorandum on remedial action objectives (RAOs) and a refined list of potential State and Federal applicable or relevant and appropriate requirements (ARARs) based on the information provided in the final RI report and the baseline human health and ecological risk assessments.

The Respondent shall prepare the RAO memorandum in accordance with Section X of the Settlement Agreement (EPA Approval of Plans and Other Submissions) and the schedule in Attachment I to this SOW.

9. Activity #5: Development and Screening of Remedial Alternatives

The Respondents shall prepare a technical memorandum summarizing the work performed in the development and screening of alternatives and the results of each task described in the technical memorandum including, but not limited to:

- 1). A description of the general response actions and the areas or volumes of contaminated media to which they apply;
- 2). A description of the remedial technology types and process options applicable to each general response action;
- 3). The results of the initial screening of remedial technology types and process options;
- 4). A description of the remedial alternatives;
- 5). The results of the screening of alternatives based on effectiveness, implementability and cost; and
- 6). A description of the alternatives that remain after screening and the action-specific State and Federal ARARs for each alternative.

The Respondents shall submit the technical memorandum for EPA review and EPA approval in accordance with Section X of the Settlement Agreement (EPA Approval of Plans and Other Submissions) and the schedule in Attachment I to this SOW.

10. Activity #6: Treatability Studies

The EPA, in consultation with the Respondents, will determine if treatability studies are necessary to provide sufficient data to allow treatment alternatives to be fully developed and evaluated during the feasibility study and/or to reduce the cost and performance uncertainties for treatment alternatives to levels sufficient to allow the EPA to select a remedy in the ROD. If such treatability studies are necessary, the Respondents shall refer to the *Guidance for Conducting Treatability Studies under CERCLA*, EPA No. 540/R-92/071A, OSWER Directive #9355.3-01/FS (Oct. 1992).

10.1 Treatability Studies Work Plan

Where the EPA, in consultation with the Respondents, determines that treatability studies are required, and unless the Respondents can demonstrate to the EPA's satisfaction that they are not needed, the Respondents shall submit a draft treatability studies work plan for EPA review and EPA approval in accordance with Section X of the Settlement Agreement (EPA Approval of Plans and Other Submissions) and the schedule in Attachment I to this SOW. The treatability studies work plan will describe the type of treatability study to be performed (*e.g.*, bench scale or pilot scale) and will include:

- 1). A discussion of background information;
- 2). A list of key personnel and responsibilities;
- 3). A description of the remedial technologies to be tested;
- 4). DQOs for each test, including measurements of performance;
- 5). The experimental procedures for each test;
- 6). A SAP that describes the samples to be collected, sample collection procedures, sampling handling and tracking procedures, DQOs, a QAPP and analytical methods;
- 7). A data management plan;
- 8). A HASP; and
- 9). A plan for management of waste generated during the treatability study.

10.2 Treatability Studies Technical Report

Upon the EPA approval of the treatability studies work plan, the Respondents shall implement the work plan. Following completion of the treatability study, the Respondents shall analyze and interpret the study results in a technical report submitted for EPA review and EPA approval in accordance with Section X of the Settlement Agreement (EPA Approval of Plans and Other Submissions) and the schedule contained in the EPA-approved treatability studies work plan. In the report, the Respondents shall evaluate the effectiveness, implementability, and cost of each technology and compare test results with predicted results. The Respondents shall also evaluate full-scale application of the technology including a sensitivity analysis identifying key parameters affecting full-scale operation.

11. Activity #7: Detailed Analysis of Alternatives

Upon EPA approval of the Development and Screening of Alternatives Technical Memorandum, the Respondents shall perform a detailed analysis of the remaining remedial alternatives. The detailed analysis shall be sufficient to allow the EPA to adequately compare the alternatives; select a remedial action; and demonstrate satisfaction of the CERCLA statutory remedy selection requirements pursuant to Section 121(b)(1)(A).

The Respondents shall assess each alternative against the following seven of the nine evaluation criteria contained in the National Contingency Plan, 40 C.F.R. § 300.430(e)(9)(iii):

- 1). Overall protection of human health and the environment;
- 2). Compliance with ARARs;
- 3). Long term effectiveness and permanence;
- 4). Reduction of toxicity, mobility, and volume;
- 5). Short-term effectiveness;
- 6). Implementability; and
- 7). Capital and operating and maintenance costs.

The Respondents shall conduct the detailed analysis of alternatives by evaluating each alternative against the seven evaluation criteria above and then performing a comparative analysis between remedial alternatives. The major objective of this activity is to evaluate the relative performance of each alternative with respect to each criteria and consider the tradeoffs of each in order to select one, or a combination of several alternatives, as a comprehensive remedy. This also helps ensure that the advantages and disadvantages of each alternative are clearly understood.

11.1 Feasibility Study Report

In accordance with Section X of the Settlement Agreement (EPA Approval of Plans and Other Submissions) and the schedule in Attachment I to this SOW, the Respondents shall prepare a draft Feasibility Study (FS) report (FS Report) which summarizes the development and screening of remedial alternatives and the detailed analysis of alternatives. The Respondents shall refer to EPA's the EPA's *Guidance for Conducting Remedial Investigations and Feasibility Studies*

Under CERCLA, EPA 540/G-89/004, OSWER Directive #9355.3-01 (Oct. 1988) and *A Guide to Developing and Documenting Cost Estimates during the Feasibility Study* (EPA 540-R-D0-002, OSWER Directive #9355.0-75) for an outline of the FS Report and the required report content. The EPA will review the Respondent's draft FS Report, and select the preferred alternative. The EPA may confer with other interested agencies in selecting the preferred alternative.

11.2 Alternatives Analysis for Institutional Controls and Screening

The Respondents shall submit a technical memorandum on the Institutional Controls identified in the Memorandum on Development and Screening of Alternatives as potential remedial actions. The Alternatives Analysis for Institutional Controls and Screening shall (1) state the objectives (*i.e.*, what will be accomplished) for the Institutional Controls; (2) determine the specific types of Institutional Controls that can be used to meet the remedial action objectives; (3) investigate when the Institutional Controls need to be implemented and/or secured and how long they must be in place; (4) research, discuss and document any agreement with the proper entities (*e.g.*, state, local government entities, local landowners, conservation organizations, Respondents) on exactly who will be responsible for securing, maintaining and enforcing the Institutional Controls. The Alternatives Analysis for Institutional Controls and Screening must also evaluate the Institutional Controls identified in the Memorandum on Development and Screening of Alternatives against the nine evaluation criteria outlined in the NCP (40 C.F.R. § 300.430(e)(9)(iii)) for CERCLA cleanups, including but not limited to costs to implement, monitor and/or enforce the Institutional Controls. The Alternatives Analysis for Institutional Controls and Screening will be submitted as an appendix to the Draft Feasibility Study Report.

ATTACHMENTS I-III
STATEMENT OF WORK
FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY
FOR
ANACONDA ALUMINUM Co COLUMBIA FALLS REDUCTION PLANT SITE,
COLUMBIA FALLS, MONTANA

I. SCHEDULE OF DELIVERABLES AND ACTIVITIES

The Respondents shall deliver documents and perform activities described in this SOW in accordance with the following schedule:

SOW Reference	Paper Copies Required	Deliverable or Activity	Schedule* *"Day" or "day" shall mean a calendar day in accordance with Section IV (Definitions) of the Settlement Agreement*
Section 4		Notification of Field Work for Each Investigative Phase of Remedial Investigation	14 days prior to field work
Section 4		Notification of Completion of Field Activities for Each Investigative Phase of Remedial Investigation	14 days after completion of field activities
Section 4		Monthly progress report for all RI/FS Work	10 days after the close of the month covered by the progress report
Section 5.1.1		Assemble Existing Information	Not later than 30 days after Effective Date of Settlement Agreement
Section 5.1.2	X	Project Scoping Proposal	Not later than 30 days after Effective Date of Settlement Agreement
Section 5.1.3		Conduct Field Visit	30 days after submission of project scoping proposal
Section 5.1.3		Notification of Field Visit	14 days prior to field visit
Section 5.1.3		Field Visit Report	5 days after field visit
Section 5.1.4	X	Project Scoping Summary	30 days after field visit
Section 7		Project Database	Not later than 30 days after Effective Date of Settlement Agreement
Section 7		Project Database Updates	7 days after completion of data validation following sampling or data collection or compilation
Section 8.1		Project Scoping Follow-up Meeting	45 days after submission of project scoping summary; provide agenda and supporting materials 14 days prior to meeting
Section 8.1		Summary of Major Outcomes of Project Scoping Follow-up Meeting	7 days after project scoping follow-up meeting
Section 8.2	X	Draft RI/FS Work Plan	30 days from receipt of EPA approval of summary of the major outcomes of scoping meeting
	X	Final RI/FS Work Plan	14 days from receipt of EPA's comments on Draft RI/FS Work Plan
Section 8.3	X	Health and Safety Plan (HASP)	Concurrent with Draft RI/FS Work Plan
Section 8.41	X	Draft Sampling and Analysis Plan (SAP)	30 days from receipt of EPA's approval of the RI/FS Work Plan
	X	Final SAP	14 days from receipt of EPA's comments on Draft SAP

SOW Reference	Paper Copies Required	Deliverable or Activity	Schedule* *"Day" or "day" shall mean a calendar day in accordance with Section IV (Definitions) of the Settlement Agreement*
Section 8.4.1	X	Draft Phase-Specific SAPs with updated HASPs	90 days prior to anticipated start of field work
	X	Final Phase Specific SAPs with updated HASPs	14 days from receipt of EPA's comments on Draft SAP
Section 8.4.2	X	Draft Field Sampling and Data Evaluation Summary Report for each investigative phase of RI	Date specified in EPA-approved final SAP for each phase
	X	Final Field Sampling and Data Evaluation Summary Report for each investigative phase of RI	Date specified in EPA-approved final SAP for each phase
Section 8.5	X	Draft Reuse Assessment	30 days prior to commencing Baseline Human Health Risk Assessment and Ecological Risk Assessment
	X	Final Reuse Assessment	14 days from receipt of EPA's comments on Draft Reuse Assessment
Section 8.6[1]	X	Draft Baseline Human Health Risk Assessment and Ecological Risk Assessment	90 days from EPA approval of Final Field Sampling and Data Evaluation Summary Report
	X	Final Baseline Human Health Risk Assessment and Ecological Risk Assessment	45 days from receipt of EPA's comments on Draft Baseline Human Health Assessment and Ecological Risk Assessment
Section 8.7	X	Draft Remedial Investigation Report	90 days following approval of the Final Human Health Risk Assessment and Ecological Risk Assessment
	X	Final Remedial Investigation Report	45 days following receipt of EPA's comments on Draft Report
Section 8.8	X	Draft Remedial Action Objectives Memorandum	60 days following approval of the Final Remedial Investigation Report
	X	Final Remedial Action Objectives Memorandum	14 days following receipt of EPA's comments on Draft Remedial Action Objectives Memorandum
Section 9	X	Draft Development and Screening of Alternatives Technical Memorandum	45 days following approval of the Remedial Action Objectives Memorandum
	X	Final Development and Screening of Alternatives Technical Memorandum	14 days following receipt of EPA's comments on the Draft Development and Screening of Alternatives Technical Memorandum
Section 10.1	X	Draft Treatability Studies Work Plan	30 days after receiving notice from EPA that treatability studies are required

[1]These can be combined or separate documents.

SOW Reference	Paper Copies Required	Deliverable or Activity	Schedule* *"Day" or "day" shall mean a calendar day in accordance with Section IV (Definitions) of the Settlement Agreement*
	X	Final Treatability Studies Work Plan	14 days following receipt of EPA's comments on the Treatability Studies Work Plan
Section 10.2	X	Draft Treatability Studies Technical Report	Date specified in EPA-approved Final Treatability Studies Work Plan
	X	Final Treatability Studies Technical Report	Date specified in EPA-approved final Treatability Studies Work Plan
Section 11	X	Draft Detailed Analysis of Alternatives	60 days following approval of the Final Development and Screening of Alternatives Technical Memorandum
	X	Final Detailed Analysis of Alternatives	14 days following receipt of EPA's comments on Draft Detailed Analysis of Alternatives
Section 11.1	X	Draft Feasibility Study Report	60 days after EPA approval of final Analysis of Alternatives or final Treatability Studies Technical Report, whichever is later
	X	Final Feasibility Study Report	14 days after receiving EPA's comments on Draft Feasibility Study Report
Section 11.2	X	Draft Alternatives Analysis for Institutional Controls and Screening	Concurrent with Draft Feasibility Study Report as an appendix to that draft
	X	Draft Alternatives Analysis for Institutional Controls and Screening	30 days after receiving EPA's comments on draft Feasibility Study Report

II. REFERENCES

United States Environmental Protection Agency. *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 5th ed. (EPA-821-R-02-012 (Oct. 2002)).

United States Environmental Protection Agency. *Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates*, 2nd ed. (EPA/600/R-99/064 (Mar. 2000).

III. PRIMARY GUIDANCE DOCUMENTS

Remedial Investigations/Feasibility Studies

Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, Interim Final. EPA No. 540/G-89/004, OSWER Directive #9355.3-0.

Data Management/Spatial Data

EPA Region 8 Superfund Remedial Data Management Plan (Version 0.8 (Apr. 2, 2015 Draft))

EPA Region 8 GIS Deliverable Guidance (Version 1.1 (Jun. 1, 2015))

Cost Estimates

A Guide to Developing and Documenting Cost Estimates during the Feasibility Study. EPA 540-R-D0-002, OSWER Directive #9355.0-75.

Reuse Assessments

Reuse Assessments: A Tool To Implement the Superfund Land Use Directive, OSWER Directive #9355.7-06P (2001).

Risk Assessment

Interim Final Risk Assessment Guidance for Superfund, Volume I - Human Health Evaluation Manual (Part A), RAGS, EPA-540-1-89-002, OSWER Directive #9285.7-01A.

Interim Final Risk Assessment Guidance for Superfund, Volume I - Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments), RAGS, EPA 540-R-97-033, OSWER Directive #9285.7-01D.

Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, ERAGS, EPA-540-R-97-006, OSWER Directive #9285.7-25.

Treatability Studies

Guidance for Conducting Treatability Studies under CERCLA, EPA No. 540/R-92/071A, OSWER Directive #9355.3-01/FS.

Compliance with Other Laws

CERCLA Compliance with Other Laws Manual: Part I, Interim Final, EPA 540/G - 89/006, OSWER Directive #9234.1-01.

CERCLA Compliance with Other Laws Manual: CERCLA Compliance with the CWA and SDWA, OSWER Directive 9234.2-06/FS

Institutional Controls

Institutional Controls: A Guide to Planning, Implementing, Maintaining, and Enforcing Institutional Controls at Contaminated Sites (Dec. 2012)
Institutional Controls: A Guide to Preparing Institutional Control Implementation and Assurance Plans at Contaminated Sites (Dec. 2012)

Institutional Controls: A Site Manager's Guide to Identifying, Evaluating and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups, EPA 540-F-00-005, OSWER Directive #9355.0-74FS-P (Sept. 2000)

APPENDIX B
TO
ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT
FOR REMEDIAL INVESTIGATION/FEASIBILITY STUDY
FOR
ANACONDA ALUMINUM Co COLUMBIA FALLS REDUCTION PLANT SITE,
COLUMBIA FALLS, MONTANA

SITE MAP